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June 23, 2011

Delta Stewardship Council
980 9th Street, Suite 1500
Sacramento, CA 95814*Sent via e-mail: deltaplancomment@deltacouncil.ca.gov***Subject: Sacramento Regional County Sanitation Comments Regarding
Fourth Staff Draft Delta Plan Dated June 13, 2011**

Dear Chairman Isenberg and Council Members:

The Sacramento Regional County Sanitation District (SRCSD) is providing the following comments and suggested language changes for the Fourth Staff Draft Delta Plan (Fourth Draft) released on June 13, 2011. SRCSD appreciates the Delta Stewardship Council's (Council) recognition that the Delta Plan will be an evolving plan over time, informed by science, adaptive management, and applicable law and policy. However, as noted in previous comment letters to the Council, we still have a number of concerns that we are requesting to be addressed in the Fourth Draft. Some of our overarching concerns are outlined below, while our detailed comments and suggested language changes are included in Attachment 1. In general, SRCSD has concerns with the following aspects of the Fourth Draft:

- Ambiguity of Covered Actions & Consistency Determinations;
- Unreasonable and Unsubstantiated Performance Measures; and
- Inequitable Financing Mechanisms for the Delta Plan.

Ambiguity of Covered Actions & Consistency Determinations

Clearly identifying what is a covered action is important to the Council and project proponents. The Fourth Draft has improved on this aspect. However, additional revisions are necessary to ensure clarity. For instance, the Water Code Section 85057.5(b) clearly states that a covered action does not include a regulatory action of a state agency. Accordingly, clarifying language must be included and examples provided in the Delta Plan that state any project(s) stemming from a regulatory action of a state agency are exempt from consistency determinations, such as the issuance of a NPDES permit by a Regional Water Quality Control Board or a California Endangered Species Act permit issued by the Department of Fish and Game.

Unreasonable and Unsubstantiated Performance Measures

SRCSD recognizes performance measures are an important tool to help evaluate the effectiveness of actions being undertaken and is an essential element for an adaptive management process. However, they must also be aligned with existing state and federal processes. For instance, water quality objectives are established to provide reasonable protection of beneficial uses. It is inappropriate for the Council to provide a “blanket” recommendation to reduce contaminant loads with no relationship to beneficial uses or to specifically establish a numeric performance target for ammonia in the Delta Plan.

For instance, the reduction of loads for management sake is neither efficient nor necessary. Under current regulations, such management is reserved for constituents where an exceedance of established water quality objectives is occurring or threatened. This properly places priority on management actions that will create, or have the potential to create, a benefit in terms of beneficial use protection. It is unreasonable, and in conflict with the Regional Water Board’s mandate under the California Water Code, to require load reductions which are not based on the reasonable protection of beneficial uses. SRCSD suggests that WQ R7 be modified from reducing contaminant loads to instead recommending the Water Boards develop appropriate water quality objectives and then implement those objectives.

SRCSD appreciates the improvements and level of detail in the Water Quality chapter over the previous drafts of the Delta Plan – our specific comments on various elements of this chapter are detailed in the attachment. The recognition of salinity as a significant water quality issue in the Delta is correct and we have some suggested language to strengthen the discussion. Our participation and partial funding of the Drinking Water Policy over the last decade allows us to provide the most recent technical study results, and gives us a broad focus on nutrients. Despite the conceptual understanding that nutrients can influence algae growth they are among multiple factors that regulate the abundance of algae in the Delta, such as flow, temperature, and invasive bivalves. We have stated our concerns with the research of Dr. Richard Dugdale and Dr. Patricia Glibert in numerous correspondences and do so here again, with specific language change requests.

The goal to develop water quality objectives for nutrients, where needed, is appropriate. However, it has not yet been determined where and to what level any such objective is needed. The Delta is a complex ecosystem and changing the balance of essential nutrients before the effects of such manipulations are understood could have grave consequences. As a result, the driver performance measure on page 120, lines 36-38 must also be modified. This performance measure attempts to establish a water quality objective for ammonia without following state Water Code or federal Clean Water Act (CWA) processes. The scientific rigor required by the CWA and Water Code should be followed to ascertain if a water quality objective is needed to ensure beneficial uses are not impaired. The proposal in this performance measure to have total ammonia concentrations in Delta waters below 4 micromoles (μM) per liter (56 parts per billion) in greater than 95% of all monitoring samples is inappropriate and could be misused or cited incorrectly as a regulatory standard.

Inequitable Financing Mechanisms for the Delta Plan

As Chapter 9 is written, the rate payers in the Sacramento area would pay a disproportionate share of the costs associated with Delta sustainability efforts. Not only would they be paying significantly higher fees associated with water and wastewater infrastructure upgrades and levee improvements, but they would also be paying, a public goods charge, and if recreating in the Delta, a recreational fee. To place an additional “stressor” fee on top of these other substantive rate increases the Delta region will already be experiencing is unreasonable and will have severe economic consequences.

As noted in previous comments, the proposed “stressors pay” approach represents an attempt to punitively assess fees on entities that are operating in compliance with existing law, working to protect beneficial uses, and are already paying significant sums in both permit fees and costs to comply with permitting requirements and meet applicable water quality standards. Our primary concern is that the proposed “stressor fee” is not an appropriate revenue mechanism as applied to National Pollutant Discharge Elimination System (NPDES) permit holders. The Fourth Draft Plan proposes to assess this fee on all discharges of contaminants, regardless of whether the discharger is operating in compliance with its NPDES Permit and without an analysis of whether the discharge is actually impacting beneficial uses. Moreover, the Fourth Draft Plan specifically states that credit should not be given for waste treatment costs, despite the fact that these actions are required and protect human health and the environment.

The Regional Water Board is required to develop permit effluent limitations to ensure that NPDES discharges do not cause or contribute to violations of adopted water quality standards, thereby protecting beneficial uses. NPDES dischargers are required to meet adopted numeric and narrative water quality standards that are protective of human health and the environment. SRCSD’s discharge is in compliance with our permit under the Clean Water Act and Porter Cologne, is protective of beneficial uses, and therefore does not fit into a category for an “other stressor” fee. Compliance with such limitations requires billions of dollars of capital costs and very significant annual operation and maintenance costs. For instance, with the adoption of its new NPDES permit in 2010, SRCSD will be spending an additional \$11.5 million dollars on special studies and over \$2 billion on facility upgrades. This does not include the over \$1.5 million that SRCSD spends annually for permit fees, monitoring fees for the Surface Water Ambient Monitoring Program (SWAMP), and other water quality monitoring costs required pursuant to our existing permit.

If stressor fees are to be established, they would most appropriately be based on the degree to which the pollutant loading affects beneficial uses of Delta Water ways and provide credit to those entities that will be spending billions of dollars in facility improvements in efforts to help improve the Delta. SRCSD’s discharge meets water quality objectives over 99% of the time, and beneficial use impacts from our discharge have not been demonstrated. To require further costs to ratepayers absent an identifiable impact to beneficial uses is illogical, and could be perceived as punitive.

The Plan proposes recovering the \$50 million combined annual expenditures of the Council, the Delta Conservancy (Conservancy), and the Delta Protection Commission (Commission) through requesting the legislature to grant the Council the authority to develop reasonable fees for beneficial uses and those who stress the Delta. Does this mean that beneficiary fees would only be applied to

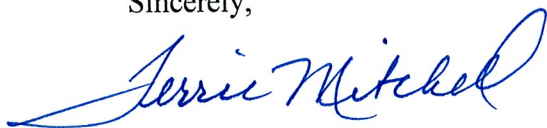
water diverters from the Delta, and potentially the Delta watershed, in addition to stressor fees? Yet no contributions are being recommended from beneficiaries of flood control, ecosystem restoration, etc. If fees are to be assessed, they should be applied to all beneficiaries and stressors, not just a select few.

In addition, the notion of repayment to the state for fronting costs for the early years of the Delta plan is unrealistic. The state should cover the start up costs of the Council, Conservancy, and Commission to implement the Delta Plan without expecting reimbursement until a more permanent financing plan is established. A first step in establishing a permanent financing plan is to complete an assessment of current fees and what those fees are funding. In looking at how current fees are allocated, there could be some restructuring that would enable the Council to have a stable base of funding for initial costs.

In summary, the Finance Plan chapter should clearly identify all sources of funding (existing and proposed) that will be used to finance programs and projects in the Delta, not just suggest new fees on a select few entities to support the Council, Conservancy, and Commission's operations. In addition, we recommend that the Delta Plan include a more detailed outline of the fee authorization framework, as well as the public review process, that would include legislative oversight. As currently written, the Finance Plan Chapter provides far too much discretion to the Council in establishing a fee structure and does not fairly evaluate all potential funding possibilities.

We look forward to the fifth draft of the Delta Plan and hope you find our attached specific comments with recommended language changes useful for developing the fifth draft. If the Council or staff has any questions about these comments, please contact me at mitchellt@sacsewer.com or 916-876-6092 or Linda Dorn, dornl@sacsewer.com or 916-876-6030.

Sincerely,



Terrie Mitchell
Manager, Legislative and Regulatory Affairs

Attachment: SRCSD Specific Comments on the Fourth Draft of the Delta Plan by Chapter, Page and Line Number

cc: Stan Dean, District Engineer, SRCSD
Prabhakar Somavarapu, Director of Policy & Planning, SRCSD
Linda Dorn, Environmental Program Manager, SRCSD
Tom Howard, State Water Resources Control Board Executive Officer
Pamela Creedon, CVRWQCB Executive Officer
Cliff Dahm, Delta Science Program
Richard Norgard, Chair Delta Independent Science Board
Mike Healy, Co-Chair, Delta Independent Science Board

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All suggested language changes will use strikeout for deletions and bold and underscore for additions. Note that all references are listed at the end of this attachment.

Chapter 1 The Delta Plan

The discussion of the geographic scope of the Delta Plan is confusing, and the recommended language change could clarify the scope of the Delta Plan.

**Page 16, line 31 through page 19, line 8, and Figure 1-2
Geographic Scope of Delta Plan**

The Fourth Draft states that the “geographic scope of the Delta Plan must include areas that divert water upstream of the Delta and those areas that receive export water from the Delta.” The Fourth Draft then refers to considerations related to the Council “setting these boundaries.” It then refers again to a geographic “scope” and a Primary Planning Area and Secondary Planning Area. We believe these provisions, as they currently stand, can create confusion. For example, there is no further reference in the Fourth Draft to these “Planning Areas,” and no specific separation of plan recommendations or provisions by Planning Area, leaving open the question of what the terms mean, or relate to.

It is undeniable that activities outside the Delta can affect the Delta. Also, we perceive that the Council has attempted to be responsive to concerns that prior drafts suggested overly expansive jurisdiction. Nonetheless, the purpose and significance of the above-referenced text is very unclear. We believe it is appropriate for the Council to reinforce the concept that activities outside the Delta are important, and that several plan recommendations implicate activities outside the Delta. However, for stakeholders, one concern is whether the geographic “scope” enlarges the class of activities that are subject to consistency determinations. For the public as a whole, clarity is needed.

Accordingly, SRCSD recommends the following changes:

Geographic Scope and Use of **Considerations and** the Delta Plan

The Delta Plan is a management plan “for the Delta.” (Water Code, section 85059). Determinations of consistency with the Delta Plan relate to certain projects that occur in whole or in part in the Delta. However, ~~Because~~ because California’s water supply reliability and Delta ecosystem concerns are united in the Delta, the geographic scope of area taken into consideration in developing the Delta Plan must include areas that divert water upstream of the Delta and those areas that receive export water from the Delta. In ~~setting these boundaries~~ **this regard**, the Council ~~recognized~~ **recognizes** that the Delta Reform Act requires that the Delta Plan address certain statewide water issues vital to sustainable management of the Delta (see, for example, Water Code sections 85020(a), (d), (f), and (h), 85302(b), 85304, and 85307(a)).

The ~~scope~~ **area considered in development** of the Delta Plan encompasses the Delta and Suisun Marsh, the Delta watershed, and areas of the state that use water from the Delta watershed, as shown in Figure 1-2.

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- The Primary ~~Planning~~ Area **taken into consideration** includes the legal Delta (as defined by the Delta Protection Act of 1992) and the Suisun Marsh. For purposes of the Delta Plan, the Delta and the Suisun Marsh are collectively referred to as the “Delta,” unless otherwise specified. Figure 1-3 shows the Delta and Suisun Marsh.
- The Secondary ~~Planning~~ Area **taken into consideration** includes the Delta watershed, the Upper Trinity River Watershed, and areas outside the Delta in which exported water is used.

Chapter 2 Science and Adaptive Management for a Changing Delta

Page 26, lines 22-23- SRCSD generally supports the adaptive management concepts identified in the Fourth Draft. There are, however, practical considerations that deserve attention. For some covered actions, adaptive management may not be an applicable concept. Thus, SRCSD recommends the following:

As relevant to the purpose and nature of a project ~~Proposed-proposed~~ covered actions should include an adaptive management plan that considers all nine steps of this framework; however, they need not be rigidly included and implemented in the order described here.

Chapter 3 Governance: Implementation of the Delta Plan

We recommend the Council adheres to the statute regarding the interpretation of what is a “significant impact” for defining what a covered action is. We also recommend the addition of issuance of a National Pollution Discharge Elimination System as an example of an exemption from a covered action and include any projects required as part of the regulatory action to be exempt from consistency determinations. SRCSD believes the plan should make clear that consistency determinations will be made based on the regulatory policies in the plan, and not other parts of the plan, therefore we have provided regulatory policy language to clarify what the consistency determinations will be made on.

Page 44, lines 19-23- The Fourth Draft cites the definition for “covered action” from the Delta Reform Act on page 43. It then reviews the application of the four criteria that must be met in order for an action to be a covered action. However, with respect to one part of the test established by the Legislature, the Fourth Draft states that the “Council has determined” the meaning of a “significant impact”. In essence, the Council’s interpretation would be that the statutory term “significant impact” means “substantial change in existing conditions” and that the term incorporates direct and indirect, and cumulative effect, considerations.

We believe it is unnecessary and imprudent to “determine” the meaning of the statute through the Draft Plan. Also, the proposed determination itself creates need for interpretation, and is not consistent with the statute. Accordingly, SRCSD recommends:

In addition, a proposed plan, program, or project must have a “significant impact” ~~under~~ ~~Water Code section 85057.5(a)(4). For this purpose, the Council has determined that~~ “significant impact” means a substantial change in existing conditions that is directly,

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~~indirectly, and/or cumulatively caused by a project and that will affect~~ on the achievement of one or both of the coequal goals or the implementation of government-sponsored flood control programs to reduce risks to people, property, and State interests in the Delta, **as provided in Water Code section 85057.5(a)(4).**

Page 44, Line 26 –Projects required through a regulatory action should be exempted from consistency determinations, such as the issuance of a NPDES permit by a Regional Water Quality Control Board. We recommend adding the issuance of a NPDES permit, and any related activities required as part of that State/Federal permit, as well as the California Endangered Species Act permit example.

We suggest the following changes:

A regulatory action of a State agency (such as the adoption of a water quality control plan by the State Water Resources Control Board), **the issuance of an National Pollution Discharge Elimination System Permit by the Regional Water Quality Control Boards,** or the issuance of a California Endangered Species Act permit by the Department of Fish and Game)

Page 47, lines 2-13-The Fourth Draft states a policy that “all covered actions must be fully transparent by disclosing all potentially significant adverse environmental impacts and mitigation of those adverse impacts.” As a general concept, this makes sense, but the policy as proposed creates significant questions. Most importantly, the policy largely restates requirements of CEQA, but is there an intention to impose obligations going beyond CEQA compliance? If not, would the Council have review authority over local agencies’ CEQA determinations? Would this be in addition to judicial review already available to review the local agency’s CEQA determinations?

Also, as discussed in earlier comments, adaptive management may or may not be an applicable concept for a given covered action. The Fourth Draft’s nine-step adaptive management framework appears suited to restoration and conservation activities or mitigation measures, but much less so to other activities. For example, if SRCSD were to approve a project to deliver recycled water to meet a certain demand in the Delta, physical structures might be built to do so, but it is difficult to ascertain what a nine-step adaptive management program could be.

Finally, in order to avoid any possibility of future misunderstandings with respect to how the Council is structuring the plan, SRCSD recommends an explicit statement, as a policy, that consistency refers to the regulatory policies and not other aspects of the document containing the specific policies.

Based on the above, SRCSD recommends as follows:

G P1 Certification of consistency with the Delta Plan must address the following:

- All covered actions must be fully transparent by disclosing all potentially significant adverse environmental impacts and mitigations of those adverse impacts. **This requirement is satisfied if the proponent of the covered action or a lead agency prepares an environmental impact report or initial study under CEQA.**

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- As relevant to the purpose and nature of the project, all covered actions must document use of best available science (as described in Chapter 2) and information.
- **As relevant to the purpose and nature of the project, ~~Ecosystem~~ ecosystem restoration and water management covered actions or adopted environmental mitigation for covered actions** must include adequate provisions to assure continued implementation of adaptive management consistent with the **adopted policies in the** Delta Plan. This requirement shall be satisfied through:
 - a) an adaptive management plan that describes the approach to be taken for each of the nine steps of the adaptive management framework of Chapter 2, and
 - b) documentation of access to adequate resources and delineated authority by the entity responsible for the implementation of the full adaptive management process.

GP2 Determination of consistency with the Delta Plan consists of determination of consistency with the regulatory policies in the Plan. Council reviews of consistency determinations are, similarly, related to consistency with the regulatory policies of the Plan.

Chapter 4 A More Reliable Water Supply For California

The difference between water supply reductions for urban and agriculture is not clear from the text in this chapter. Compliance schedules for NPDES projects or programs are 10 years maximum, and it is not clear in this chapter why a 20 year planning period is specified for implementation of water conservation, water efficiency, and water supply projects or programs. Perhaps footnote 13 would help explain the 20 year planning period, but it is missing. Lastly SRCSD recommends that the DWRs public participation process for water contract negotiations only apply to project-wide State Water Project (SWP) contract amendments, and contract amendments to transfer Table A amounts between existing SWP contractors.

Page 60-61, Figure 4-4 and Figure 4-5 – The Plan looks to increase water supplies through demand reduction. The targets indicate urban water use is supposed to be reduced by 3 maf out of the estimated 5 maf (in 2005) used, yet agricultures target is only 1 maf reduction out of approximately 30 maf used. The urban use reduction target is 50% while agricultures target is minimal compared to the usage. What is the reason for such an insignificant target for agricultures water supply reduction?

Page 64, Lines 1-23- Several sections in Chapter 4 refer to a 20 year planning period for implementation of programs and projects in water conservation, water efficiency, and water supply development. Yet the complex and expensive design and construction projects that are mandated for NPDES permittees are not given similar time periods for planning, design and implementation, which are given only a maximum ten year period for compliance. The Delta Stewardship Council Staff should work closely with the State Water Resources Control Board Staff(s) and the Regional Water Quality Control Board Staff(s) to draft regulatory language that extends the time allowed for

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compliance for major construction projects that are required by NPDES permits for which technology is new or not yet readily available. Artificially accelerated design and construction for complex projects increases costs without allowing the appropriate time for, analysis, planning, construction, and adaptive management.

Page 74, Lines 3-22, and footnote 26, WR P4-The public participation process set forth in Department of Water Resources’ “Principles Regarding Public Participation Process in State Water Project Contract Negotiations” should not be imposed on water transfer agreements involving water from the State Water Project (SWP) or the use of SWP facilities for the following reasons.

- 1) Those Principles are expressly limited to project-wide SWP contract amendments, and contract amendments to transfer Table A amounts between existing SWP contractors.
- 2) Those Principles themselves were never formally promulgated as regulations, with the required public review and comment, under the Administrative Procedure Act.
- 3) There are a multitude of potential water transfer transactions that could involve the use of SWP facilities.

Requiring that the negotiations of those potential transfers be conducted in public could unduly delay and encumber the parties’ ability to conduct and complete negotiations, thereby impeding water transfers between willing buyers and sellers. Finally, there are already opportunities for public comment and participation in the attendant environmental review processes for water transfer agreements under CEQA and NEPA, and with the review and approval of such agreements by public agency buyers and sellers.

Accordingly, we recommend the following language changes.

WR P4 To be consistent with the Delta Plan, future contracts and agreements to export water from the Delta and/or to move water through the Delta **by project-wide SWP contract amendments, and contract amendments to transfer Table A amounts between existing SWP contractors** shall be developed in a transparent manner consistent with Department of Water Resources’ revised procedures adopted in 2003.

Chapter 5 Ecosystem Restoration

A general comment on the subsection “Reducing Threats and Stresses” is that some of the stresses to the ecosystem are the result of historical choices made related to infrastructure construction, and public safety. The Delta plan should allow adequate time to correct these types of issues so as to avoid placing an undue and unrealistic economic burden on the local economies. The Delta Plan should properly prioritize changes to infrastructure and public works or publically funded capital improvement projects or other projects that place a significant financial burden on California residents and businesses by allowing appropriate phasing, timing, and providing funding assistance as required. All required projects or activities should be evaluated to determine whether reasonable proof exists that the project will result in a measurable and significant benefit or improvement to the Delta ecosystem. The plan should not impose artificial deadlines on projects but rather should consider that improvements to the Delta ecosystem will take many years.

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Chapter 5 addresses removal of multiple stressors. Regulators should develop a financing plan for partial removal of stressors from sources that are not the generators of the stressors. For instance, a POTW is the recipient of loading of certain contaminants that come, in part, from the surface waters that flow into customers homes from the drinking water supply system and flow out into the sewer systems. Yet a POTW might be designated as the responsible party for the resulting load that is returned to the surface water and regulated via a NPDES permit. The contaminants regulated via the NPDES permit process are often only a fraction of the load in the surface water and may not make an overall measureable difference in the downstream surface water concentration, yet may require a significant cost to remove. No financing is offered for this type of contaminant removal which may be a very small and often un-measurable fraction of the loading in the receiving waters.

Prioritization and cost benefit analysis should be performed for focusing on which stressors should be addressed sooner rather than later. Perhaps the workshops proposed in ER R7 could help address what gives the environment the best benefit for the cost. SRCSD would like to participate in workshops to develop recommendations to the Council for measures to reduce stressor impacts on the Delta ecosystem.

Page 88, Lines 19-22- ER P1 Item #2 - This section recommends the State Water Board cease issuing water rights permits if flow objectives are not established for the Delta by June 2, 2014. We recommend continuing to allow beneficial water rights permits, such as water transfers for water recycling, even if the State Water Board does not meet the June 2, 1014 date.

Page 94, Lines 31-33- The concept of addressing multiple stressors, wherever possible, does not include any consideration of what is a priority to address, and at what cost. Some actions may have more benefit to the environment than others, such as the control of invasive species. Pursing everything at once does not seem rational.

Page 95, Lines 13-20, ER R7- The language change to include the State Water Resources Control Board's involvement with any workshops that are developed to provide recommendations to minimize stressor impacts is appreciated. However the Regional Water Quality Control Boards for the San Francisco Bay Area and Central Valley should also be included as they are the regulatory entities for Clean Water Act regulatory programs (wastewater, stormwater, irrigated agriculture, etc.) in the Delta. SRCSD would like to participate as an "other relevant" agency bringing our relative expertise, and adding value to any recommendations that would be developed.

We recommend the following changes.

The Delta Science Program, in conjunction with the California Department of Fish and Game, the California Department of Water Resources, the State Water Resources Control Board, **and San Francisco Bay and Central Valley Regional Water Quality Control Boards,** and other relevant agencies should conduct workshops to develop recommendations to the Council for measures to reduce stressor impacts on the Delta ecosystem that would support and be consistent with the coequal goals.

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Chapter 6 Improve Water Quality to Protect Human Health and the Environment

SRCSD appreciates the improvements and level of detail in the Water Quality chapter over the previous drafts of the Delta Plan. The recognition of salinity as a significant water quality issue in the Delta is correct and we have some suggested language to strengthen the discussion. Our participation and partial funding of the Drinking Water Policy over the last decade allows us to provide the most recent technical study results, and gives us a broad focus on nutrients. Despite the conceptual understanding that nutrients can influence algae growth they are among multiple factors that regulate the abundance of algae in the Delta, such as flow, temperature, and invasive bivalves. We have stated our concerns with the research of Dr. Richard Dugdale and Dr. Patricia Glibert in numerous correspondences and do so here again, with specific language change requests.

The goal to develop water quality objectives for nutrients, where needed, is appropriate. However, it has not yet been determined where and to what level any such objective is needed. The Delta is a complex ecosystem and changing the balance of essential nutrients before the effects of such manipulations are understood could have grave consequences. We recommend that potential stressors not be considered independently from one another or from other contributing factors, as they do not act independently in the Delta. Performance measures should be selected that directly relate to the recommendation to be clear indications of success or failure to meet goals. If the overall goal is to increase spring diatom blooms in Suisun Bay then this should be an *Outcome Proposed Measure* for an integrated Delta management plan where the interactions are clearly described and there is a high confidence that these relationships and the conceptual models are understood. We should first be measuring progress towards establishing a water quality objective, and then measure progress towards achieving the water quality objective.

Page 109, line 18: The following statement is made: “Municipal and industrial discharges can also increase salinity.” This statement, and the associated discussion of salinity on pages 108 through 110, are misleading and create a false impression of the factors that are important drivers of salinity in the Delta. SRCSD refers the Council to the excellent description of the factors which influence salinity in the Delta that is captured in the recent City of Tracy decision rendered in Sacramento Superior Court. As noted in this decision, it has been well established, and well documented, for decades that operations of the SWP and CVP have a major influence on salinity conditions in the Delta. In comparison, municipal discharges have a de minimus effect. The Delta Plan should accurately portray this knowledge. The Delta Plan should also include information regarding the Cease and Desist Order that has been adopted by the State Water Board that requires DWR and the Bureau of Reclamation to meet salinity objectives in the Delta by 2017. The Delta Plan should also include a discussion of the State Water Board’s ongoing effort to re-examine salinity objectives in the South Delta as part of its Bay-Delta Planning effort. The absence of this information from the Delta Plan is a glaring omission.

The following edits are requested:

Municipal and industrial discharges can also locally increase salinity, although the impacts on overall Delta salinity are typically insignificant.

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Page 110, Lines 8 – 10-The following statement is made:

As discussed in the following section on drinking water quality, contamination of municipal water supplies makes water unpalatable, contributes to the formation of harmful disinfection byproducts, and increases corrosion of pipes and equipment.

This statement is inaccurate and very misleading. We are requesting this sentence be deleted for the reasons below.

To support this point, note that on line 3 of the same page, the following statement is made:

Water quality at the State Water Project (SWP) and Central Valley Project (CVP) export pumps in the south Delta, while usually meeting all applicable standards for municipal and agricultural use, is significantly higher in salinity than Sacramento River inflow to the Delta.

This statement accurately characterizes water quality conditions at the export pumps based on available data and contradicts the notion that waters in the Delta are “unpalatable”. It also contradicts the notion that Delta waters are excessively corrosive, since they typically meet applicable standards for EC.

With regard to the inference that Delta waters are causing the formation of harmful disinfection by-products (an assertion connected to organic carbon or bromide rather than salinity), the fact is that water suppliers that use Delta water must meet (and do meet) Safe Drinking Water Act water treatment rules and regulations which are intended to prevent the formation of harmful levels of disinfection by-products in tap water. Water treatment plants which utilize Delta water supplies are designed and operated to deal with the range of organic carbon levels that are present in Delta waters (Malcolm Pirnie, 2011).

For these reasons, we are requesting the following change:

~~As discussed in the following section on drinking water quality, contamination of municipal water supplies makes water unpalatable, contributes to the formation of harmful disinfection byproducts, and increases corrosion of pipes and equipment.~~

Page 110, lines 20-25: The SWRCB, through its Delta flow criteria report, has clearly demonstrated that the current salinity and flow regime in the Delta are unfavorable for native estuarine fish species. The use of the words “may be” is inappropriate in describing current salinity and flow regime impacts to native fish. The statement that salinity is negatively impacting municipal uses needs clarification as to the locations, timing and magnitude of impact, since a reluctance to modify salinity regimes to improve conditions for native fish is being counterbalanced by these impacts. This appears to be a clear area where the co-equal goals of the Delta Plan are in conflict. More definitive information as to how this conflict will be resolved is needed in the Delta Plan.

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The following edits are suggested:

The current salinity and flow regime of the Bay-Delta Estuary ~~may be~~ **is** creating conditions unfavorable for native estuarine fish and favorable to introduced species. Current salinity conditions, at certain times and locations, also negatively impact municipal and agricultural uses of Delta water. Allowing salinity to vary in a way that benefits native fish species might further degrade the quality of Delta water for agricultural and municipal uses. **significant attention must be placed on the examination and resolution of this conflict**

Page 110, lines 32- 34, 40-45-As noted in the comment above, the statements that levels of organic carbon in Delta waters leads to formation of harmful chemicals (disinfection by-products) in tap water is very misleading. Again, water treatment plants utilizing Delta water are designed and operated to avoid the formation of harmful disinfection by-products in tap water as a requirement of the federal Safe Drinking Water Act. A recent study by Malcolm Pirnie (2011) has indicated that existing and projected future levels of organic carbon at the SWC and CVP pumps in the south Delta will not cause significant problems or increase costs to water suppliers in meeting current requirements under the SDWA.

For these reasons we are requesting the following changes:

These drinking water constituents of concern [referring to bromide, organic carbon, nutrients and dissolved solids (salinity)] are not directly harmful in drinking water but ~~lead to formation of harmful chemicals during drinking water treatment or contribute to taste, odor, or other municipal water supply problems.~~ **must be addressed through drinking water treatment design and operation.**

...bromide and organic carbon in municipal water supplies **can** contribute to the formation of harmful disinfection by-products ~~if when~~ water is **not properly** treated for domestic use...

Page 110, lines 37 and 38 and page 111, lines 17-20: These statements regarding pathogens are misleading and inaccurate. Based on a review of recently available data (which was not available for the Tetra Tech study in 2007), levels of *Cryptosporidium* measured at the SWP and CVP intakes and other water intakes in the Delta are all at very low levels, levels which do not require special treatment beyond normal disinfection at water treatment plants under the SDWA Long Term Enhanced Surface Water Treatment Rule. The statement that these protozoa are present and therefore pose a risk implies that the risk is significant and/or unacceptable i.e. exceeds the one in ten thousand risk level for tap water as allowed under the SDWA. Such is not the case from either a drinking water or body contact recreation standpoint.

The following edits are suggested:

Pathogenic protozoa, bacteria, and viruses are also present in Delta waters ~~and~~ **but** are **not present at levels that pose** a disease risk for both drinking water and body contact recreation.

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...*Giardia lamblia* and *Cryptosporidium parvum*, have been found in Delta waters **at low** ~~occasionally exceeding recommended~~ levels for drinking water sources or body contact recreation (Tetra Tech 2007). Source waters that exceed drinking water regulatory thresholds for *Cryptosporidium* trigger additional pathogen removal requirements (USEPA 2004), **although available data do not demonstrate that such conditions currently exist in the Delta.**

Page 111 Lines 24-28-Regarding the effect of nutrient levels in the Delta on the occurrence of taste and odor problems in water supplies, available information indicates that significant reductions in nutrient levels in the Delta (which may or may not be consistent with the attainment of the co-equal goal of ecosystem health) would not likely remedy the episodic taste and odor problems that occur for various water agencies.

While it is true that nutrients are an important factor in determining the abundance of algae, they are not the only one. Other important factors affecting algae abundance include flow, temperature, and invasive bivalves (in the Delta) and these should be listed to remove the current implication that nutrients are solely the cause of excessive algae growth. For example, despite the effects of nutrients on excessive algae growth in the Delta it was found that flow was the main contributing factor explaining the abundance of certain algae (Lehman 2008).

We recommend the following changes:

For drinking water supplies, excessive levels of nutrients are primarily of concern in the Delta because they, **among other factors that regulate algae abundance such as flow, temperature, and invasive bivalves,** can stimulate algae growth both in the Delta and in water storage reservoirs (Tetra Tech 2006a). Algae blooms in storage reservoirs can disrupt treatment processes and cause taste and odor problems. Taste and odor complaints associated with Delta water supplies have been attributed ~~to algae growth in reservoirs or in the Delta itself (DWR 2007),~~ **primarily to films of benthic cyanobacteria that grow on the sides of the reservoirs and on the dams (Izaguirre & Taylor 2007). So far, it has not been possible to predict taste and odor events in the SWP on the basis of nutrient loads from in-Delta sources or in-channel nutrient concentrations. Because of the characteristics of T&O sources, a potential conclusion is that the control of nutrients should not be for the purpose of controlling taste and odors (Lee 2008). Management of this issue through nutrient controls has not been established to be warranted or effective.**

The narrative alleging an association between nutrients and taste-and-odor (T&O) events in the SWP exaggerates the evidence for an association between T&O-causing organisms and the nutrient status of drinking water sources. Nutrient control measures have proven to be ineffective as management tools to control T&O events or the distribution and abundance of T&O-causing microbes, both in the SWP and in other drinking water sources across the country. The diverse ecological niches occupied by T&O causing organisms may explain why nutrient reduction is an ineffective strategy for reducing T&O events in drinking water systems. Many organisms which produce the T&O compounds MIB and geosmin are not algae, but heterotrophic organisms including actinomycete bacteria, myxobacteria, fungi, and amoebas. Growth of these heterotrophic organisms are not ecologically well-linked to dissolved nutrient supplies in the water column. Even where T&O episodes have been linked to pelagic cyanobacteria, the events are not well-explained

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by the nutrient status or planktonic productivity of the systems. Outbreaks of Chrysophytes, and their PUFA derivatives, show little apparent relationship to nutrients on a broad scale (Watson et al. 1997; Watson et al. 2001). For example, despite the fact that the Great Lakes have undergone nutrient remediation, they are now exhibiting erratic T&O outbreaks, despite reduced offshore nutrient levels (Watson et al. 2008). Geosmin and MIB-associated T&O events occur along the shoreline of the basin in Lake Ontario where planktonic algal biomass is low enough for the system to be characterized as oligomesotrophic. In contrast, in a shallow embayment of Lake Ontario (Bay of Quinte) which is more nutrient rich (meso-eutrophic), odor impairment is less extensive and has little impact on municipal drinking water supplies (Watson et al. 2007). Despite 5+ years of extensive field and laboratory research by the Ontario Water Works Research Consortium to determine the major causes of T&O outbreaks and identify key predictors, managers are still not able to predict the inter-annual variation in the intensity of the events (Watson et al. 2007). Although nutrient concentrations are poor predictors for T&O events, regression approaches using a suite of environmental variables have shown air and/or water temperature to be a strong correlate with T&O compound concentrations in at least four reservoirs (Tung et al. 2007; Uwins et al. 2007; Yen et al. 2007). In their review, Watson et al. 2008, concluded:

“there are no robust relationships between total plankton biomass, toxins, and T&O compounds in the Great Lakes and other source waters.”

Benthic cyanobacteria are responsible for most of the T&O events reported in the literature in terminal reservoirs receiving water from the SWP. Almost all of the T&O events in Diamond Valley Lake in Southern California are associated with films of benthic cyanobacteria (*Oscillatoria* or *Phormidium* spp.), which grow on sides of the reservoir and on the dam. The benthic colonies in Diamond Lake form on sediments 3-17 m deep (Izaguirre & Taylor 2007), usually in late summer. This indicates that they are frequently positioned near the thermocline, where they would have greater access to diffusive fluxes of nutrients released at the sediment/water interface during summer stratification. MIB producing strains of *Oscillatoria* that have been isolated from other southern California reservoirs (Lake Mathews, Las Virgenes Reservoir, Lake Bard, Lake Skinner, and Silverwood Lake) are also benthic forms (Izaguirre & Taylor 2007). The range of depths - and thus total surface area - available to these colonies will vary positively with water clarity. Consequently, decreases in phytoplanktonic biomass (such as might be the aim of nutrient reduction strategies) are likely to increase the available substrate for the main culprits of T&O episodes in these reservoirs. The importance of epibenthic microbes as T&O producers indicates that reservoir bathymetry, and patterns of reservoir drawdown, will be more effective management tools in the control of T&O causing organisms than nutrient control in source waters.

Lee (2008) summarized T&O-related presentations by J. Janik (Metropolitan Water District (MWD)), R. Losee (MWD), and P. Hutton (MWD), given at the March 25, 2008, California Water and Environmental Modeling Forum (CWEMF) “Delta Nutrient Water Quality Modeling Workshop”. Main points from the talks included the following:

- T&O problems in reservoirs supplied by the SWP are caused primarily by geosmin and MIB released by benthic cyanobacteria.
- At this time there is limited ability to relate nutrient loads or in-channel (aqueduct) concentrations to domestic water supply water quality.

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- It is not possible to adequately model the relationship between nutrient load to a waterbody and the development of benthic and attached algae in that waterbody.

Overall, it not possible to predict how reducing the nutrient loads to the Delta and from in-Delta sources will impact the location, magnitude, or frequency of taste and odors problems. Because of the characteristics of T&O sources, a potential conclusion is that the control of nutrients should not be based on an attempt to control algae-caused taste and odors.

Page 111, lines 37-40- The work group that is working with the Central Valley Regional Water Board to develop a drinking water policy has completed significant elements of its technical work plan over the past several years. The constituents of concern that the work group has addressed are organic carbon, nutrients, pathogens and salinity. The technical elements that have been completed have included detailed source investigations, water quality data compilation and analysis, source control studies, mathematical modeling of future population growth and source control scenarios, and associated drinking water treatment studies. One significant finding is that future population growth in the Central Valley at planned levels of source control is not anticipated to cause a deterioration of water quality in the Delta. Another significant finding is that future drinking water treatment costs will not be affected by organic carbon source control efforts aimed at municipal and agricultural sources. This finding helps resolve the historic concern by water agencies that Delta water quality is getting worse for parameters that drive water treatment costs such as organic carbon. It should be noted that the work group studies have not included a specific assessment of changes in TOC levels that may result from planned wetlands restoration projects in the Delta or the impacts of those changes on water treatment operations. The work group tools and studies would be very helpful in a future assessment of these changes and impacts by others.

Regarding the purpose of the drinking water policy development effort, the primary purpose was to assess the need for additional regulations to protect drinking water uses in the Delta based on the completion of the technical studies mentioned above. The effort has been outcome-based since its inception and is in the process of assessing the need for possible Basin Plan amendments. A product of the effort will be specific Basin Plan amendment language, as appropriate.

The following edits are suggested:

A major concern for municipalities using Delta water is what the future holds for water quality, ~~Sea level rise, levee failure, salinity variability, and~~ **although it is not clear that** population growth in the watershed pose[s] a threat to drinking water quality. The Central Valley RWQCB is developing a drinking water policy that is, in part, intended to **address the need for additional regulatory requirements to protect** ~~prevent degradation of~~ high quality drinking water sources...

Page 112, Lines 12-13- Regarding WQ R1, California Regional Water Quality Control Board Central Valley Region Resolution No. R5-2010-0079 states “*The Central Valley Water Board is committed to developing a comprehensive Drinking Water Policy for the Delta and tributaries, and the Central Valley Water Board encourages the Workgroup to continue to work with staff to develop a comprehensive policy if adequate resources are available.*” The Drinking Water Policy Work Group has been funded through grant funding provided by Proposition 50, funds provided by the California Urban Water Agencies (CUWA) and SRCSD. However, funding is still needed to

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complete the required technical tasks remaining for the development of a comprehensive drinking water policy, including completion of the water quality and watershed modeling, and the water quality monitoring. The Delta Stewardship Council should work with the State Water Board and the Central Valley Regional Water Board, ensuring that funding is available to allow the work group to complete the remaining technical tasks in developing a comprehensive Drinking Water Policy that is scientifically defensible.

Page 113, Lines 1-3-The Delta Plan overstates the strength of the evidence in Dugdale et al. (2007) for ammonium control of phytoplankton blooms in Suisun Bay. Dugdale et al. (2007) and the related article Wilkerson et al. (2006) are frequently interpreted as evidence that ammonium-induced inhibition of nitrate uptake prevents spring algal blooms from developing in the brackish Delta when conditions are otherwise favorable. However, the time series of field data presented in both publications shows that the ammonium inhibition threshold proposed by these investigators (4 μM), based on rate measurements made in small container incubations, is not a good predictor of phytoplankton blooms. Also, no time series data are presented in either of these publications regarding several other environmental parameters (e.g., stratification, benthic grazing rates of clams, herbivorous zooplankton abundance, residence time, Delta outflow, euphotic zone depth) to compare with their records of phytoplankton biomass, although these parameters are known to be critically important to the determination of whether or not conditions are “favorable” for blooms and whether variations in these other parameters are triggering blooms.

In the time series data presented in Wilkerson et al. (2006) and Dugdale et al. (2007), algal blooms were evident in Suisun Bay only twice out of five periods when ammonium concentrations fell below 4 μM (Figure 1), and one of the blooms (Spring 2003) failed to yield chlorophyll-a levels above 10 $\mu\text{g/L}$ - a level which is frequently (albeit perhaps inappropriately) referenced as a minimum threshold for nutritional adequacy for Delta zooplankton (Müller-Solger et al. 2002).

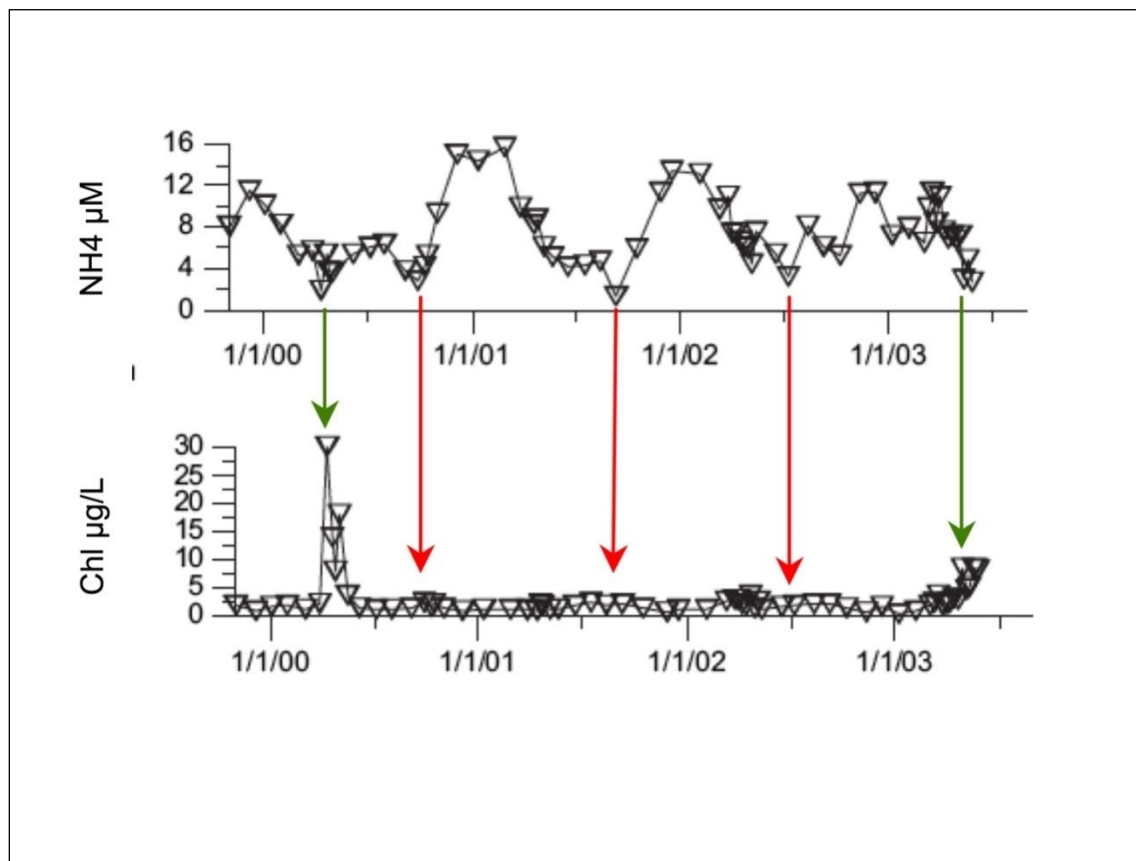


Figure 1. Time series of ammonium and chlorophyll-a from Suisun Bay. Green arrows indicate where ammonium concentrations below a 4 μ M threshold were accompanied by increases in chlorophyll-a. Red arrows show periods when similarly low ammonium concentrations were not accompanied by increases in chlorophyll-a. Panels are from Figure 1 in Dugdale et al. (2007); identical time series are presented in Wilkerson et al. (2006).

This lack of consistent correspondence between ammonium concentrations and bloom occurrence is a good illustration that other factors frequently prevent blooms in Suisun Bay, even when ammonium concentrations are below the “Dugdale” threshold of 4 μ M.

Time series limited to measurements of ammonium and chlorophyll-a (such as in Wilkerson et al. 2006 and Dugdale et al. 2007) cannot rule out the possibility that low ammonium concentrations *in situ* are the *result* of a bloom triggered by non-nutrient factors, rather than the *cause*. The same interpretation problem applies to the recent field work funded by the San Francisco Regional Board, in which ammonia and chlorophyll-a were measured about twice per month during the spring/summer of 2010 - work which has not been made available in a public report, but which was presented by Marchi et al. in a talk at the Bay-Delta Science Conference September 27-29, 2010. The interpretation of field data for ammonia and chlorophyll-a collected on such a coarse time scale – and the absence of accompanying data for *other drivers* of phytoplankton biomass collected on fine time scales- fails to rule out the possibility that *other* environmental factors initiate blooms in Suisun Bay, and that low ammonium concentrations are a *result* of the blooms (not a requirement for them).

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In other words, while some have argued that an absence of blooms in Suisun Bay when ambient ammonium levels are above 4 μM is proof of the Dugdale hypothesis, an important alternative hypothesis is that blooms are triggered by other factors and subsequently depress observed ambient ammonium levels below the “Dugdale” threshold. To date, no one has performed the continuous monitoring of ambient ammonia, phytoplankton pigments, light penetration, vertical stratification, and other co-factors that would be needed to demonstrate the validity of the Dugdale hypothesis outside the laboratory.

We recommend the following change:

Dugdale et al. (2007) showed that ammonium concentrations above 4 μM (~0.56 parts per million) **inhibit nitrate uptake in short-term incubations of water from Suisun Bay.** ~~were inhibitory to the growth of phytoplankton in Suisun Bay~~ **However, time series of field data showed that phytoplankton blooms occurred on less than half of the occasions when ammonium concentrations were below 4 μM (~0.56 parts per million), illustrating that other factors frequently prevent such blooms in Suisun Bay.**

Page 113, Lines 12-15-The Delta Plan mischaracterizes Glibert’s (2010) portfolio of CUSUM correlations as a demonstration of a complete cascade of effects through the food web caused by ammonium or nutrient ratios. Despite widespread public perception to the contrary (and setting aside the fact that correlation analysis was invalid and produced spurious relationships as explained in Cloern et al. 2011), Glibert failed to relate trends in nutrient ratios to those of phytoplankton or copepods in her article. Several obvious pairings of environmental variables were omitted from Glibert’s portfolio of CUSUM correlations, including those that were needed for her to claim that nutrient ratios and phytoplankton taxa were statistically related. For example, CUSUM regressions between nutrient *ratios* (TN:TP, $\text{NO}_3\text{:NH}_4$, or DIN:DIP) and phytoplankton indices (chlorophyll-a or abundances of individual taxonomic groups) were not included in her analysis. Also, CUSUM trends in nutrient ratios were not directly compared to those for copepod abundance. $\text{NO}_3\text{:NH}_4$ trends were not compared to *any* of the biological trends (phytoplankton, copepods, clams, or fish); they were only compared to trends in Delta outflow. As a consequence, Glibert’s publication did not make the case (even accepting its flawed statistical approach) that N:P ratios and phytoplankton composition are statistically related to each other, nor that N:P ratios are related to other abundances of other organisms (copepods) near the base of the pelagic food web in the Delta. In addition, the only pairing Glibert included in her paper of a phytoplankton taxon with an organism higher in the food was a single regression plot between CUSUM flagellates and CUSUM *Pseudodiaptomus* – trends in other phytoplankton taxa central to her hypothesis for ammonia-effects (such as diatoms and cyanobacteria) were not compared to trends in copepods or fish.

We recommend the following change:

Glibert hypothesized an important role for ammonium concentrations and the ratio of inorganic nitrogen to inorganic phosphorus in the changing structure of the phytoplankton community, **and also hypothesized that those changes might be related to changes at higher trophic levels.** ~~Glibert also conducted statistical analyses to show that changes in the phytoplankton community cascade through the food web, ultimately affecting the fish community of the Delta.~~

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Page 113, Lines 19-32- While it is true that nutrients are an important factor in determining the abundance of algae, they are not the only one. Other important factors affecting algae abundance include flow, temperature, and invasive bivalves (in the Delta) and these should be listed to remove the current implication that nutrients are solely the cause of excessive algae growth. For example, Despite the effects of nutrients on excessive algae growth in the Delta it was found that flow was the main contributing factor explaining the abundance of the harmful algae *Microcystis* and the toxin it produces, microcystin (Lehman 2008).

The narrative on HABs would be more balanced if it better recognized important non-nutrient drivers of HABs, especially recent work in the Delta regarding non-nutrient drivers of *Microcystis*.

We recommend the following change:

Another concern with regard to impacts from nutrient loading in the Delta is the emergence of harmful algal blooms (HABs) over the past decade. The shift toward greater abundance of cyanobacteria in the Delta includes known HABs. In particular, *Microcystis aeruginosa* has become a common bloom forming component of the phytoplankton of the Delta during the warm summer and early fall months (Lehman 2005, 2008). *Microcystis* species prefer warm temperatures (Paerl and Huisman 2008), do well in lower- light regimes, and need higher concentrations of inorganic nitrogen like ammonium and nitrate to thrive (Ward and Wetzel 1980). Lehman et al. (2008) and Mioni (2010) found that water temperature was strongly positively correlated with *Microcystis* abundance and toxicity in the Delta; and, that water transparency, flows, and specific conductivity were also potential drivers of *Microcystis* blooms in the Delta. In addition, resistance to grazing by molluscs (Vanderploeg et al. 2011) and Delta copepods (Ger et al. 2010) may confer a selective advantage to *Microcystis* and may operate to enhance or prolong *Microcystis* blooms in the Delta. Heisler et al. (2008) in a recent review of HABs worldwide concluded that 1) degraded water quality from increased nutrient pollution promotes the development and persistence of many HABs, 2) the composition (not just total quantity) of the nutrient pool impacts HABs, 3) high-biomass blooms require an external source of nutrients to be sustained, 4) both chronic and episodic nutrient delivery promotes HAB development, and 5) management of nutrient inputs to the watershed can lead to significant reductions in HABs. Despite the conceptual understanding that nutrients can influence algae growth they are among multiple factors that regulate the abundance of algae in the Delta, such as flow, temperature, and invasive bivalves. A study of the Lower Sacramento River, San Joaquin River, and Old River determined that flow was the main contributing factor explaining the abundance of the harmful algae *Microcystis* and the toxin it produces, microcystin (Lehman 2008). Interactions between nutrients and HABs in the Delta deserve, and are receiving, significant current research support.

Adding this language would contribute to the balanced approach presented in other parts of Chapter 6 and be consistent with the concluding statement in this paragraph indicating the need for a better understanding of the interactions between nutrients and HABs.

Page 113 Line 15-18 - The Cloern et al. (2011) critique of Glibert (2010) deserves more attention in the nutrient narrative, especially considering that the co-authors of Cloern et al. (2011) are preeminent Delta researchers with decades of experience in the estuary. Following the Council's

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policy of using best available science, we recommend at least acknowledging that no relationship between ammonium and fish abundance is apparent when untransformed data are examined, and the widespread professional opinion (backed up by abundant peer-reviewed research) that native fish declines are a response to multiple stressors –as expressed by Cloern et al. in the following passage:

“However, Glibert’s (2010) study piqued our curiosity about correlations between CUSUM-transformed variables because it contradicts the overwhelming weight of evidence that population collapses of native fish (Sommer et al. 2007) and their supporting food webs in the San Francisco Estuary are responses to multiple stressors including landscape change, water diversions, introductions of exotic species, and changing turbidity (Bennett and Moyle 1996; Kimmerer et al. 2005; Cloern 2007; Jassby 2008; Mac Nally et al. 2010; Thomson et al. 2010). We ask here how CUSUM transformation leads to inferences about such cause effect relationships when visual inspection of the data series (e.g., Fig. 1) shows no association between wastewater ammonium and fish abundance. Cloern et al. (2011)

We recommend the following change.

This conclusion has been strongly challenged by Cloern et al. (2011), who ~~argued~~**demonstrate** that the statistical methods used to derive the food web relationships are inappropriate and generate false correlations, **argue that no relationship between ammonium and fish abundance is apparent when untransformed data are examined, and list other peer-reviewed literature indicating that population collapses of native fish in the estuary are responses to multiple stressors including landscape change, water diversions, introductions of exotic species, and changing turbidity.**

Page 18, Lines 7-8-The definition of “emerging pollutants” suggests that (a) data exists, in the Delta or elsewhere, that would indicate the existence of adverse effects in the Delta and (b) any pollutant in this class should be treated specially from a management perspective. In fact, the general term emerging pollutants really pertains to the large list of pollutants that are currently not regulated through the use of numeric water quality criteria or objectives. In large part, the absence of criteria or objectives owes to the scarcity of scientific information that would indicate the levels at which adverse effects are known to occur. It is appropriate to be aware of this class of pollutants and to be ready to react to new criteria or objectives as they are developed. It is not appropriate to convey a unique regulatory or management status to this class of pollutants.

We recommend the following changes:

”Emerging pollutants” are **a broad class of** unregulated compounds where **concern exists that evidence suggests** adverse effects might occur at environmentally relevant concentrations. ~~The term is also meant to include the wide range of compounds whose anticipated risks, or existing but so far unrecognized risks, might justify precautionary management interventions~~

Page 118, Line 15 - The statement: “Emerging pollutants are typically relatively persistent, may have bioaccumulation potential, and are toxic...” is a generalization and is inaccurate and misleading. The named characteristics - persistence, bioaccumulative potential, and toxicity – are loaded terms that are highly pollutant specific, depend greatly on ambient concentrations as to the

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level of concern, and, in the case of toxicity, also depend on other factors such as duration and frequency of exposure. Certainly, within the broad class of pollutants that are currently unregulated, there are numerous pollutants for which this statement is untrue.

We recommend the following changes:

Specific pollutants within the broad class of ~~Emerging pollutants may be are typically relatively persistent, may have bioaccumulation potential, and are~~ **or may exhibit toxicity under certain conditions**...

Page 118, Lines 19-20-This statement, which is factually accurate, contradicts, or at least greatly diminishes, the notion stated in the definition of “emerging pollutants” that adverse effects may occur at environmentally relevant concentrations. Additionally, the fact is that information to be able to determine sublethal or chronic effects is scarce. Therefore, the ability to evaluate or interpret ambient or source monitoring data is very limited, since threshold effects levels are not available for most of the pollutants in this classification.

Page 118, Lines 29-30-Again, these statements are misleading in that they convey a level of significance of concern that is unwarranted based on available information. Also, the second sentence confuses detection with the determination of an adverse effect. This illustrates the problem with the collection of monitoring data in the absence of established criteria, objectives or other effects thresholds. In such circumstances, detection, inappropriately, becomes the threshold for concern.

We recommend the following changes:

Concern is increasing over exogenous chemicals that disrupt natural endocrine system, functions of humans and aquatic species such as steroid hormones...detergent metabolites...and pesticides. Such chemicals are routinely found in agriculturally impacted surface water samples from the Napa River and Sacramento River-, **although not at levels that are known to cause adverse effects.**

Page 118, Lines 39-43- Please clarify that regulatory agencies such as the SWRCB and regional Water Quality Control Boards are responsible for monitoring and assessing the presence, identification, concentrations, and distributions of emerging contaminants in the Delta and to demonstrate linkages between adverse effects. Dischargers may monitor for contaminants of emerging concern once standard methods are available, but it is not their responsibility to evaluate the potential for adverse effects.

The statements in this section put an exclamation point on the previously stated concerns. It calls generically for monitoring “emerging pollutants” (a list potentially in the thousands or tens of thousands) without any level of prioritization, suggests “linking” the collected data to the “literature” to determine potential impacts, and then calls for the implementation of control measures. Again, this is for a class of pollutants which suffer from a lack of knowledge regarding environmental effects and for which neither water quality criteria nor water quality objectives exist. No rationale is given, or is known to exist, for the suggested abandonment of the California Water

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Code and Clean Water Act processes of establishing criteria, objectives and/or standards based on scientific knowledge of effects, and then regulating to achieve those values in ambient waters.

We recommend the following changes:

Effective management of emerging pollutants in the Delta will require regulatory agencies 1) **perform appropriate planning level activities to prioritize a specific list of pollutants of highest concern and to develop work plans for appropriate special studies or monitoring efforts for those pollutants, and 2)** to conduct monitoring **and special studies in accordance with the work plans.** ~~assessments of the identities, concentrations and distributions of emerging pollutants and 2) to demonstrate the linkage between newly identified emerging pollutants to known or suspected adverse impacts such as acute and chronic toxicity (including endocrine disruption) and bioaccumulation in aquatic species. As region-specific data become available with monitoring and within the context of toxicology literature, further action to implement control measures for emerging pollutants can be taken by the responsible regulatory agencies~~

Page 119 Lines 2-4- We recommend the following language change to accurately reflect all sources of pollutants.

Pollutants contained in municipal, industrial, agricultural, ~~and~~ other nonpoint source discharges, **and natural and legacy sources flowing into** ~~to~~ the Delta and its tributary waterways, including pollutants that bioaccumulate and biomagnify in the food web, contribute to the impairment of the Delta ecosystem.

Page 119, Lines 14-17- Recommendation WQ R5, first bullet, is to develop and adopt water quality objectives for nutrients in the Delta. This is a complex task that is unlikely to be completed by the recommended deadline of January 1, 2014. The current draft Delta Plan recognizes that there is debate over the potential nutrient effects in the Delta and, in fact, and that focused research on the potential for ammonia affects on the POD has been occurring for at least the past five years. Therefore, it is extremely optimistic to suggest that a final water quality objective can be adopted within 2.5 years from the time this draft was issued, let alone in a shorter period from when the Delta Plan is adopted.

There are several issues that complicate the development of water quality objectives for nutrients and differentiate them from contaminants that are entirely anthropogenic in origin. "Nutrients", as named in this draft Delta Plan, are really a number of naturally occurring chemicals that are part of a nutrient cycle and are required for a healthy Delta, or human being. Therefore, individual water quality objectives would need to be developed for multiple nutrients (e.g., NO₂, NO₃, NH₄, PO₄, etc.). Further, because nutrients are required for a healthy ecosystem they cannot simply be eliminated. A range or optimal concentration would need to be determined, which may vary in different parts of the Delta due to varying requirements of the resident organisms, and the interactions among nutrients would need to be considered. Finally, the current scientific debate over the role of nutrients in the Delta ecosystem will need to be resolved, or at least agreed to in some degree, which will likely require a greater understanding of the Delta ecosystem than is currently available.

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We recommend the following change:

The State Water Resources Control Board and the San Francisco Bay and Central Valley Regional Water Quality Control Boards should develop and adopt objectives, either narrative or numeric, where appropriate, for nutrients in the Delta and Delta watershed **after any potential impacts on the Delta ecosystem are more clearly understood** by January 1, 2014.

The goal to develop water quality objectives for nutrients, where needed, is appropriate. However, it has not yet been determined where and to what level any such objective is needed. The Delta is a complex ecosystem and changing the balance of essential nutrients before the effects of such manipulations are understood could have grave consequences. The potential damage caused by uninformed management decisions should be considered and the “right” level of nutrients determined with high confidence before taking regulatory action.

The Delta Stewardship Council Staff should work closely with the State Water Resources Control Board Staff(s) and the Regional Water Quality Control Board Staff(s) to prioritize the Basin Plan Amendment process and TMDL process to ensure that these plans and processes are prioritized to focus on the most easily controllable contaminants first, i.e. those which are known to harm the ecological system and those which can be controlled via source control such as industry change and changes to human practice or product control. The current practices used that regulate and attempt to control minute sources of contaminants from point and non-point sources such as mercury that are predominantly legacy issues are costly and ineffective. Programs and mandates such as these direct funding away from other more critical and more controllable issues.

Page 119, lines 35-39-Recommendation WQ R7 states, in part:

The Central Valley Regional Water Board...should require responsible entities that discharge wastewater treatment plant effluent or urban runoff to Delta waters to evaluate whether all or a portion of the discharge can be recycled, otherwise used, or treated in order to reduce contaminant loads to the Delta.

The recommendation focuses on simply reducing pollutant loads. The underlying premise is that reduced loads are always the right thing to do. This recommendation would be better were it to focus on having the Water Boards put effort into developing water quality objectives (WQOs) and then regulating to those objectives. Development of WQOs should theoretically result in a balancing evaluation between environmental needs and societal costs.

This general call for reduced loadings from Central Valley municipalities is inappropriate and goes well beyond established regulatory policies and requirements. Management of loads for management sake is neither efficient nor necessary. Under current regulations, such management is reserved for constituents where violation of established water quality objectives is occurring or threatened. This properly places priority on management actions that will create, or have the potential to create, a benefit in terms of beneficial use protection. It is unreasonable, and in conflict with the Regional Water Board’s mandate under the California Water Code, to mandate load reductions which are not based on the reasonable protection of beneficial uses.

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A case in point for this is the technical work recently completed by the Drinking water Policy work group. Water agencies have been calling for reductions in organic carbon loads from municipalities and agriculture for years, without a clear understanding of the benefits to be gained from such reductions. A recent study completed for the work group (Malcolm Pirnie, 2011) demonstrates that further load reductions in organic carbon from Central Valley municipal and agricultural sources will not create a benefit in terms of water treatment design or operations. Further, other studies completed by the work group indicate that specific numeric water quality objectives for organic carbon in the Delta are not necessary. These results demonstrate the need to evaluate the need for load reduction on a constituent-specific basis prior to requiring expensive source control measures to be implemented.

The following edits are requested:

The Central Valley Regional Water Board...should require responsible entities that discharge wastewater treatment plant effluent or urban runoff to Delta waters to evaluate whether all or a portion of the discharge can be recycled, otherwise used, or treated in order to ~~reduce contaminant loads to the Delta~~ meet adopted water quality objectives or to otherwise provide reasonable protection of beneficial uses in the Delta.

Additionally, while water recycling projects have environmental benefits, their costs are significant. Substantial funding is required to begin a recycled water program including funding for design, construction, operation and maintenance of water treatment facilities, pumping and piping systems for transporting recycled water to its point of use, and onsite systems for storage and delivery of recycled water. There must be willing recipients for the recycled water, and willing water retailers to install and operate the water distribution systems. Funding availability for a recycled water program as well as the existence of all program participants and their ability/willingness to participate in the program are all key factors in determining the feasibility of beginning a water recycling program.

Page 119, Lines 40-42-The recommendation in this section should be modified to reflect a planning and evaluation step ahead of the initiation of special studies. The purpose for each study, hypotheses to be tested, pollutants to be examined, and other factors should all be considered prior to the decision to implement a given study.

We request the following changes:

WQ R8 The State Water Resources Control Board and Regional Water Quality Control Boards should **consider** conducting ~~or require~~ special studies of pollutants including **selected** emerging contaminants and causes of toxicity in Delta waters and sediments.

Page 120, Line 25- We are requesting the following change based on the reasons detailed under page 121, lines 3-4 below.

SWRCB and RWQCBs **consider** adoption of objectives for nutrients in the Delta **in conjunction with the SWRCB NNE effort for San Francisco Bay.**

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Page 120, Lines 36-38-Driver Performance Measures, Second Bullet: The focus on 4 micromoles per liter of ammonia is inappropriate. Assuming that this level is inhibitory to diatom growth, diatom growth is just one small part of the overall functioning of the ecosystem. Water quality objectives must be developed with a much more holistic view of nutrient roles in the entire ecosystem. Also see our comments on page 113, lines 1-3.

Page 121, Lines 3 and 4-While the District supports efforts to evaluate the need for nutrient objectives in the Delta, it does not agree with the assertion that objectives are needed or that the time frame for completion of this highly complicated task (in two and one half years) is appropriate or realistic. The State Water Board process for consideration of Nutrient Numeric Endpoints (NNEs) in San Francisco Bay is just starting and is connected to any similar effort in the Delta. The development and use of mathematical models is an essential aspect of the NNE effort. The time frame for consideration of nutrient objectives in the Delta must be aligned with the San Francisco Bay NNE effort. Also, on a technical level, the need exists for either very close coordination or direct linkage between the Delta and San Francisco Bay efforts.

With regard to the presumption that reduced concentrations of all inorganic nutrients should occur, this prejudices the outcomes of the process to evaluate the need for nutrient objectives. At this point in time, as reflected in the text of the Delta Plan itself, there is significant controversy and lack of consensus regarding the need for or benefit of nutrient reductions in the Delta. The notion that progress should be shown toward ambient nutrient level reductions is clearly premature.

Therefore, the following edits are requested:

Progress toward reducing concentrations of inorganic nutrients (ammonium, nitrate, and phosphate) in Delta waters ~~over the next decade~~ **if deemed necessary as a result of the combined San Francisco Bay and Delta NNE effort.**

Page 120, Lines 36-38 -The Delta Plan appropriately reserves authority for determining water quality objectives for the State Water Board and Regional Water Quality Control Boards (with USEPA oversight). Surprisingly, in its narrative on nutrients and in its recommendation regarding nutrient criteria for the Delta, the Plan makes no mention of the approach that the State Water Board and the USEPA Region 9 adopted in 1999 to develop nutrient objectives for lakes, streams, and estuaries in California - the Nutrient Numeric Endpoint (NNE) Framework (USEPA. 2006. *Technical Approach to Develop Nutrient Numeric Endpoints for California*. Tetra Tech, Inc., Lafayette, CA). This Framework was first applied to lakes and streams, and is currently being applied to California estuaries through the activities of the Coastal Estuarine NNE (www.californiaestuarinenneproject.shutterfly.com/) and the San Francisco Estuary (SFE) NNE work groups (http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/amendment_s/estuaryenne.shtml).

The NNE Framework rejects the approach of defining nutrient impairment on the basis of nutrient concentrations. Instead it begins with identification of scientifically defensible biological response variables of nutrient over-enrichment, or *Indicators* (such as phytoplankton biomass/composition or dissolved oxygen) and the assignment of numeric thresholds to those indicators for use in determining when and where nutrient over-enrichment causes impairment. The NNE Framework

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requires the development of site-specific, mechanistic (quantitative/analytical) models to translate Indicator thresholds into nutrient concentrations or loads for nutrient management applications; the process is only considered valid when *co-determinants* of algal biomass (or other indicator variables) such as temperature, stratification, flows, light, grazing, are included as parameters in the models.

After considerable collaboration with a technical advisory team (which includes Dr. Richard Dugdale), the SFE-NNE consultant team recently released their proposals for candidate *Primary Indicators* of nutrient over-enrichment in the SFE, (McKee et al. *Numeric Nutrient Endpoint Development for San Francisco Bay Estuary: Literature Review and Data Gaps Analysis*. Draft Report, April 2011). Because of the recent attention given to ammonium/phytoplankton interactions in the estuary, the authors felt compelled to evaluate ammonium as a candidate primary indicator – although that represents a departure from the NNE Framework. However, as explained in McKee et al. (2011), ammonium was rejected as a primary indicator because it was concluded that the ecological significance of ammonium inhibition of nitrate uptake is unknown in the San Francisco Estuary (in which they include Suisun Bay and Suisun Marsh) and that based on current science, ammonium concentrations *per se* are not an appropriate indicator of nutrient impairment.

“Despite this evidence [of ammonium inhibition of nitrate uptake in Suisun Bay in Wilkerson et al. 2006, Dugdale et al. 2007], the ecological importance of ammonium inhibition of spring diatoms blooms is not well understood relative to factors known to control primary productivity, particularly in other regions of the Bay where water column chlorophyll-a appears to be increasing.... However, as with ammonium inhibition of diatom nitrate assimilation, the influence of ammonium on HABs in SF Bay has not been sufficiently investigated. Thus the linkage between ammonium concentrations and Bay beneficial uses is not at this time universally accepted.” McKee et al. (2011) p. 146

Research to date in the Sacramento River by the Dugdale laboratory at SFSU and the Central Valley Regional Board (presented in reports and at conferences) does not confirm that ammonium concentrations above the “Dugdale threshold” decrease primary production rates or shift phytoplankton composition in the freshwater Delta. The Delta Plan is correct in its statement:

It is not known, however, how much this [ammonium] inhibition extends to freshwater algae in the Delta. Current research in the Delta is addressing this question (Delta Plan, p. 113, line 6).

Given the lack of consensus regarding the ecological importance of ammonium inhibition in the *brackish Delta* also (as reflected by the decisions of the SFE-NNE work group), the Council’s elevation of the “Dugdale threshold” (4 μM NH_4) to a de-facto numeric nutrient criterion, through its explicit use as a performance measure in the Delta plan, and the arbitrary designation of a target (95% of water samples) is scientifically unwarranted, an inappropriate regulatory action, and imbalanced in comparison to other recommendations in the Delta Plan. With the exception of the salmon doubling goal (which was not designed by the Council), none of the other environmental metrics considered in the Delta Plan were assigned numeric targets in performance measures (e.g., “x% of unimpaired flow”, “x miles of habitat corridors”, “x% percent fewer invasive species”, “x acres of new tidal marsh”), although the state of science regarding their importance to ecosystem recovery is less equivocal than that for ammonia.

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We recommend the following change in the Driver Performance Measure:

~~Progress toward reducing concentrations of total ammonia in Delta waters to below 4 micromoles per liter (56 parts per billion) in greater than 95 percent of all monitoring samples collected and measured annually.~~ **meeting water quality objectives for nutrients and other constituents, as established by the SWRCB.**

Page 121, Lines 5-6-This performance measure is inappropriate and should be deleted. The notion that annual surveys of an unknown list of emerging pollutants should be required is a premature conclusion based on available information. This determination should only be made after completion of a process to evaluate the specific pollutants to be monitored, the reason for the monitoring, and the effects thresholds to be used in evaluation of collected data, at a minimum.

We recommend the following change:

~~Routine annual surveys of emerging pollutants within the Delta are designed and implemented during the first 5 years of adoption of the Delta Plan.~~

Page 121, Lines 11-12, 15-16-Outcome Performance Measures describe trends that may have no bearing on the proposed actions. A critical flaw in the *Outcome Proposed Measures* related to nutrients is that other factors that may or may not change significantly affect the measured variable. Therefore, failure to observe the indicated trend is not necessarily a failure to reduce the concentration of a target chemical. For example, spring diatom blooms may continue to be depressed by invasive clams and reduced nutrient concentrations are not necessarily going to increase spring diatom blooms in Suisun Bay. Likewise, the extent of HABs, if affected to a greater degree by flows than by nutrient concentrations as found by Lehman et al. (2008) may not be affected by reduced nutrient concentrations. First, it is recommended that potential stressors are not considered independently from one another or from other contributing factors, as they do not act independently in the Delta. Secondly, performance measures should be selected that directly relate to the recommendation to be clear indications of success or failure to meet goals. If the overall goal is to increase spring diatom blooms in Suisun Bay then this should be an *Outcome Proposed Measure* for an integrated Delta management plan where the interactions are clearly described and there is a high confidence that these relationships and the conceptual models are understood. For algae, nutrients, nutrient interactions, flow, invasive bivalves, and local species variations, fate and transport, and other contaminants need to be considered together.

We propose the following changes:

Concentrations of nutrients will meet water quality objectives. ~~Trends in occurrence of spring diatom blooms in Suisun Bay and Suisun Marsh will be upward.~~

~~Harmful algal blooms (HABs) will lessen in severity and spatial coverage in the Delta over the next decade.~~

Page 121, Lines 3-4-Driver Performance Measure, Fourth Bullet: For reasons stated above, we should not be measuring progress towards reducing concentrations of inorganic nitrogen. We

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should first be measuring progress towards establishing a water quality objective, and then measure progress towards achieving the water quality objective

Chapter 9, Finance Plan Framework to Support Coequal Goals

Page 168, Lines 33-35-Guiding Principle, Last Bullet: Basing stressor fees on the volume of contaminants discharged is a fallacy. Contaminant loadings are more appropriately expressed as concentrations or mass loadings, depending on the specific contaminant and effect on the environment. Stressor fees would most appropriately be based on the degree to which the pollutant loading affects beneficial uses of Delta Water ways. The proposed “stressors pay” approach represents an attempt to assess fees on entities that are operating in compliance with existing law, working to protect beneficial uses, and are already paying significant sums in both permit fees and costs to comply with permitting requirements and meet applicable water quality standards. If such stressor fees are to be included as part of the Delta Plan, such fees must take into account the degree to which the pollutant loading affects beneficial uses of the Delta. This would more closely correlate an entity’s impact on the Delta with amount of fees charged to a stressor. The Guiding Principles state that credit should not be given for waste treatment costs or fish screens, thereby having those entities spending billions of dollars to comply with regulatory permits, will pay additional fees to the Council as well. The absence of any credit or offset for actions undertaken to reduce a stressors impact on the Delta ecosystem creates a disincentive to undertake such actions, and at a minimum treats those entities that are not taking proactive steps towards improvement on the same footing as those “stressors” who take no actions whatsoever. The Council should remove the latter part of this provision from the Fourth Draft Plan and create a framework for crediting those entities that are making progress towards improving the Delta.

Page 173, Lines 21-24-User Fees, Second Bullet. The state should cover the start up costs without expecting reimbursement until a more permanent financing plan is established. The notion of fronting costs for the early years of the Delta plan is implausible, especially expecting repayment to the state from fees that do not currently exist, there is no legal authority to require, and no clear way of determining a way to structure a stressor fee. In passing the authorizing legislation governing development of the Delta Plan, the Legislature was aware that the state would incur some of the up-front costs of getting the Delta Plan established and did not explicitly provide for a retroactive fee mechanism such that no general fund monies would pay for the Delta Plan. Although fee revenue may ultimately be the mechanism for funding the ongoing efforts of the Council going forward, the Conservancy and the Commission, it should not be the mechanism for retroactively funding activities that were necessary for the initial stages of establishing a framework for the Delta.

The Council would have far too much discretion in establishing the fee structure to be authorized by the Legislature. Specifically, the Fourth Draft Plan states that “[t]he Legislature should grant the Council the authority to develop reasonable fees for beneficial uses, and reasonable fees for those who stress the Delta ecosystem. . .” (Fourth Draft Plan, p. 173, FP R6.) There is no mention of a particular fee structure, nor is there any designation within the Fourth Draft Plan of specific terms under which the Council could and should develop such a framework. Having the legislature give the Council the authority and the discretion to set stressor and beneficiary fees could be very problematic for even determining a method to establish such fees. It would be very difficult to separate the stressor from the benefiter when considering exports from the Delta. SRCSD is concerned that without providing at least some guidance in the Delta Plan on how the fees are to be

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assessed, the Council will be unconstrained in its ability to impose fees on local governments and other entities. Thus, we recommend that the Delta Plan include a more detailed outline of the fee authorization to be granted to the Council as part of this recommendation.

The Plan proposes recovering the \$50 million combined annual expenditures of the Council, Delta Conservancy, and Delta Protection Commission through stressor fees and beneficiary fees (mostly from water dischargers and diverters), yet no contributions are sought from beneficiaries of flood control, ecosystem restoration etc. Would the Council consider fees imposed on all those that benefit and not just a select few? In previous versions of the Delta Plan, the Council had listed other types of stressor fees, including land use charges, retail sales fees, habitat alteration fees, special diversion fees, recreation use fees, and hatchery fees, but too easily dismissed them as infeasible. Now, the Fourth Draft Plan proposes recovering the \$50 million combined annual expenditures of the Council, the Conservancy, and the Commission through stressor fees and beneficiary fees, yet no contributions are being recommended from beneficiaries of flood control, ecosystem restoration, and a long list of other beneficiaries and stressors. This seems highly selective and does not take into account all of the beneficiaries and stressors on the Delta. We recommend that the Council include a broader base of fee payers that more accurately reflects those that benefit from and contribute to stresses upon the Delta. Should the Delta Plan ultimately include “stressor” fees as a revenue raising mechanism, it must include all stressors to ensure that appropriate entities are paying their fair share.

There should be an evaluation of existing fees that are paid by the various Delta users (exporters, dischargers, agriculture, recreational users, fisherman, etc.), and then determine if any restructuring needs to take place. There is the possibility that current fees could cover at least some initial costs of the Council.

Dischargers are already paying permit fees as that fund monitoring fees for Surface Water Ambient Monitoring Program (SWAMP) in addition to any water quality monitoring that is done under permits. They should not be assessed another “stressor fee” based on the volume of contaminants discharged. Our discharges must be in compliance with state Water Code and federal CWA provisions, permit requirements and be protective of beneficial uses. Therefore, to imply that additional fees should be imposed based only on the volume of contaminants is inappropriate. If stressor fees are included, it would be more appropriate that they be based on the degree to which the pollutant loading affects beneficial uses of the Delta.

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